

What is claimed is:

1. A method for producing a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species, the method comprising the steps of:
 - (a) selecting a concentration of oxygenated species in the substantially paraffinic Fischer-Tropsch product;
 - (b) performing a Fischer-Tropsch synthesis to provide a Fischer-Tropsch product stream;
 - (c) isolating a substantially paraffinic product stream comprising oxygenated species from the Fischer-Tropsch product stream;
 - (d) purifying the substantially paraffinic product stream to remove a portion of oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species;
 - (e) monitoring the substantially paraffinic Fischer-Tropsch product for concentration of oxygenated species by GC-AED; and
 - (f) adjusting the conditions of the purification of step (d) to ensure that the concentration of the oxygenated species in the substantially paraffinic Fischer-Tropsch product complies with the selected concentration.
2. The method of claim 1, further comprising selecting a carbon number distribution of oxygenated species, monitoring the substantially paraffinic Fischer-Tropsch product for the carbon number distribution of oxygenated species by GC-AED, and adjusting the conditions of the purification of step (d) to ensure that the carbon number distribution of oxygenated species in the substantially paraffinic Fischer-Tropsch product complies with the selected carbon number distribution.
3. The method of claim 1, further comprising selecting a specific class of oxygenated species, monitoring the substantially paraffinic Fischer-Tropsch product for the class of oxygenated species by GC-AED, and adjusting the conditions of the purification of step (d) to ensure that the class of

oxygenated species in the substantially paraffinic Fischer-Tropsch product complies with the selected class.

4. The method of claim 3, wherein the specific class of oxygenated species is alcohols.
5. The method of claim 1, wherein the substantially paraffinic product stream of step (c) is isolated from the Fischer-Tropsch product stream by distillation.
6. The method of claim 1, wherein the purification of step (d) is performed by a process selected from the group consisting of hydrotreating, hydrocracking, adsorption, extraction and combinations thereof.
7. The method of claim 6, wherein the purification is performed by hydrotreating the substantially paraffinic product stream over a hydrotreating catalyst in a hydrotreating unit.
8. The method of claim 7, wherein the adjustment of step (f) is performed by a process selected from the group consisting of adjusting the catalyst temperature, regenerating the catalyst, changing the catalyst, adjusting the LHSV of the substantially paraffinic product stream passed over the catalyst, adjusting the pressure in the hydrotreating unit, and combinations thereof.
9. The method of claim 6, wherein the purification is performed by passing the substantially paraffinic product stream over an adsorbent.
10. The method of claim 9, wherein the adjustment of step (f) is performed by a process selected from the group consisting of regenerating the adsorbent, changing the adsorbent, adjusting the LHSV of the substantially paraffinic product stream passed over the adsorbent, and combinations thereof.
11. The method of claim 6, wherein the purification is performed by extraction by adding an amount of solvent to the substantially paraffinic product stream.
12. The method of claim 11 wherein the adjustment of step (f) is performed by a process selected from the group consisting of adjusting the amount of solvent added to the substantially paraffinic product stream, adjusting contacting time between the solvent and the substantially paraffinic product stream, adjusting contacting efficiency between the solvent and the substantially

paraffinic product stream, adjusting the temperature of the solvent, and combinations thereof.

13. The method of claim 11 wherein the purification is performed by extraction with water.
14. The method of claim 1 wherein the substantially paraffinic Fischer-Tropsch product is a diesel fuel additive.
15. A method for preparing a blended Fischer-Tropsch product comprising at least one oxygenated species, the method comprising the steps of:
 - (a) selecting a concentration of oxygenated species in the blended Fischer-Tropsch product;
 - (b) performing a Fischer-Tropsch synthesis to provide a Fischer-Tropsch product stream;
 - (c) isolating a substantially paraffinic product stream comprising oxygenated species from the Fischer-Tropsch product stream;
 - (d) blending the substantially paraffinic product stream with at least one non-oxygenate containing hydrocarbon stream to provide a blended product comprising at least one oxygenated species;
 - (e) monitoring the blended product for concentration of oxygenated species by GC-AED; and
 - (f) adjusting the blending ratio of step (d) to ensure that the concentration of the oxygenated species in the blended product complies with the selected concentration.
16. The method of claim 15, further comprising selecting a carbon number distribution of oxygenated species, monitoring the substantially paraffinic Fischer-Tropsch product for the carbon number distribution of oxygenated species by GC-AED, and adjusting the conditions of the purification of step (d) to ensure that the carbon number distribution of oxygenated species in the substantially paraffinic Fischer-Tropsch product complies with the selected carbon number distribution.

17. The method of claim 15, further comprising selecting a specific class of oxygenated species, monitoring the substantially paraffinic Fischer-Tropsch product for class of oxygenated species by GC-AED, and adjusting the conditions of the purification of step (d) to ensure that the class of oxygenated species in the substantially paraffinic Fischer-Tropsch product complies with the selected class.
18. The method of claim 17, wherein the specific class of oxygenated species is alcohols.
19. The method of claim 15, wherein the substantially paraffinic product stream of step (c) is isolated from the Fischer-Tropsch product stream by distillation.
20. The method of claim 15, wherein the at least one non-oxygenate containing hydrocarbon stream is comprised of a non-oxygenate containing Fischer-Tropsch product stream and the method further comprises the step of isolating the non-oxygenate containing Fischer-Tropsch product stream from the Fischer-Tropsch product stream.
21. The method of claim 20, wherein the substantially paraffinic product stream of step (c) comprises at least one alcohol and wherein the blended product is a diesel fuel with reduced emissions.
22. The method of claim 15, wherein the at least one non-oxygenate containing hydrocarbon stream is a conventional petroleum product.
23. The method of claim 15, wherein the at least one non-oxygenate containing hydrocarbon stream is a hydrotreated stream and wherein the blended product is a pumpable syncrude.
24. The method of claim 15, wherein the concentration of oxygenated species is between 100 and 5000 wppm of oxygen on a water-free basis.
25. The method of claim 24, wherein the blended product is selected from the group consisting of diesel fuel and jet fuel.
26. The method of claim 25, further comprising the step of adding to the blended product an additive selected from the group consisting of dispersants, detergents, anti-oxidants and ignition improvers.

27. The method of claim 16, wherein the concentration of oxygenated species is selected to improve the lubricity of the blended Fischer-Tropsch product and C₇-C₁₂ is selected as the carbon number distribution.
28. The method of claim 17, wherein the concentration of oxygenated species is selected to improve the lubricity of the blended Fischer-Tropsch product and C₇-C₁₂ alcohols are selected as the class of oxygenated species.
29. The method of claim ~~28~~, wherein the blended Fischer Tropsch product is a jet fuel.
30. ✓ An integrated process for preparing a blended Fischer-Tropsch product comprising at least one oxygenated species, the method comprising the steps of:
- (a) producing a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species, the method comprising the steps of:
 - (i) selecting a concentration and carbon number distribution of oxygenated species in the substantially paraffinic Fischer-Tropsch product;
 - (ii) performing a Fischer-Tropsch synthesis to provide a Fischer-Tropsch product stream;
 - (iii) isolating a substantially paraffinic product stream comprising oxygenated species from the Fischer-Tropsch product stream;
 - (iv) purifying the substantially paraffinic product stream in a purification process to remove a portion of oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising at least one oxygenated species;
 - (v) monitoring the substantially paraffinic Fischer-Tropsch product for concentration and carbon number distribution of oxygenated species by GC-AED; and
 - (vi) adjusting the conditions of the purification of step (iv) to ensure that the concentration and carbon number distribution

of the oxygenated species in the substantially paraffinic Fischer-Tropsch product comply with the selected concentration and carbon number distribution.

- (b) selecting a concentration and carbon number distribution of oxygenated species in the blended Fischer-Tropsch product;
 - (c) blending the substantially paraffinic Fischer-Tropsch product with at least one non-oxygenate containing hydrocarbon stream to provide a blended product comprising at least one oxygenated species;
 - (d) monitoring the blended product for concentration and carbon number distribution of oxygenated species by GC-AED; and
 - (e) adjusting the blending ratio of step (d) to ensure that the concentration and carbon number distribution of the oxygenated species in the blended product comply with the selected concentration and carbon number distribution.
31. The method of claim 30, wherein the at least one non-oxygenate containing hydrocarbon stream is a conventional petroleum product.
32. The method of claim 30, wherein the at least one non-oxygenate containing hydrocarbon stream is a non-oxygenate containing Fischer-Tropsch product stream and the method further comprises the step of isolating the non-oxygenate containing Fischer-Tropsch product stream from the Fischer-Tropsch product stream.
33. A method for controlling a process for producing a substantially paraffinic Fischer-Tropsch product comprising no detectable oxygenated species, the method comprising the steps of:
- (a) performing a Fischer-Tropsch synthesis to provide a Fischer-Tropsch product stream;
 - (b) isolating a substantially paraffinic product stream comprising oxygenated species from the Fischer-Tropsch product stream;

- (c) purifying the substantially paraffinic product stream to remove oxygenated species to provide a substantially paraffinic Fischer-Tropsch product comprising no detectable oxygenated species;
 - (d) monitoring the substantially paraffinic Fischer-Tropsch product for concentration of oxygenated species by GC-AED; and
 - (e) adjusting the conditions of the purification of step (c) to ensure that the concentration of the oxygenated species in the substantially paraffinic Fischer-Tropsch product is not detectable.
34. The method of claim 28 wherein the purification of step (c) is performed by a process selected from the group consisting of hydrotreating, hydrocracking, adsorption, extraction and combinations thereof.
35. The method of claim 34 wherein the purification is performed by hydrotreating the substantially paraffinic product stream over a hydrotreating catalyst in a hydrotreating unit.
36. The method of claim 35 wherein the adjustment of step (e) is performed by a process selected from the group consisting of adjusting the catalyst temperature, regenerating the catalyst, changing the catalyst, adjusting the LHSV of the substantially paraffinic product stream passed over the catalyst, adjusting the pressure in the hydrotreating unit, and combinations thereof.